

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-186951
(43)Date of publication of application : 16.07.1996

(51)Int.Cl.

H02K 7/075
A61H 23/02
B06B 1/02
H02K 7/10

(21)Application number : 06-341118

(71)Applicant : TERUUCHI HIDEO

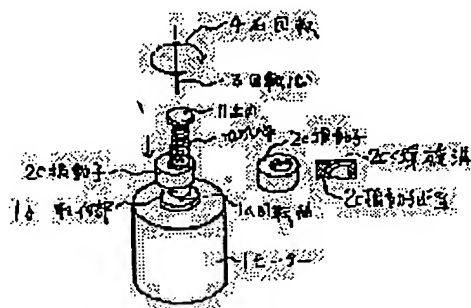
(22)Date of filing : 28.12.1994

(72)Inventor : TERUUCHI HIDEO

(54) VIBRATION QUANTITY VARYING MEANS AND CHANGE-OVER SWITCH FOR ELECTRIC VIBRATION EQUIPMENT

(57)Abstract:

PURPOSE: To freely change vibration width from small to large ones and also make multiple vibration possible by operating vibration quantity varying means having an oscillator capable of freely rotating and making eccentric from the center of rotation by switching the turning direction of a motor.
CONSTITUTION: An attaching portion 1b having a coil spring 10 attached is firmly fitted to a rotating shaft 1a at the center of rotation 3, a helical groove 2ci formed to a helical shape of the coil spring 10 is provided at the inner side of an opening of an oscillator 2c, the oscillator 2c is attached to the coil spring 10 in a freely rotatable manner helically, and a stop 11 is attached to the end of the coil spring 10. And the above operation is performed by normal- reverse rotation by means of a rotation change-over switch of a motor. By doing this, the vibration quantity of an electric vibrating equipment can be changed without using the up-and-down of the voltage by a resistor and the vibration width can be changed freely.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

(19) [Issuing country] Japan Patent Office (JP)
 (12) [Publication type] Laid-open patent publication (A)
 (11) [Laid-open number] Japanese laid-open patent publication number Hei 8-186951
 (43) [Laid-open date] July 16, 1996
 (54) [Name of the invention] Vibration varying means and selector switch for electrical vibrating devices
 (51) [International Patent Classification v. 6]
 H02K7/075
 A61H23/02332
 B06B1/02Z
 H02K7/10D
 [Examination request] Unrequested
 [Number of claims] 12
 [Filing format] Paper
 [Total number of pages] 7
 (21) [Filing number] Japanese patent application number Hei 6-341118
 (22) [Filing date] December 28, 1994
 (71) [Applicant]
 [Identification number] 591235072
 [Name] Hideo Teruuchi
 [Address] 1860 Chizuka Oaza, Satte-shi, Saitama Prefecture
 (72) [Inventor]
 [Name] Hideo Teruuchi
 [Address] 1860 Chizuka Oaza, Satte-shi, Saitama Prefecture

(57) [Abstract]

[Object] Conventionally, the vibration levels in an electrical vibrating device have been selected using voltages and resistances. The object of the present invention is to provide means for varying vibration strength in electrical vibrating devices and a selector switch for the same wherein vibration strength and vibration amplitude can be varied freely between high and low settings without using resistors.
 [Structure] A variable vibrator (2etc) is disposed on a rotation shaft (1a) on a rotation axis (3) and is operated using a motor rotation selection switch or selections are made manually with a variable section (2etc). At least two means for varying vibrations are used or a strong vibrator (2a) and a weak vibrator (2b) are disposed. A single motor (1) is used, with rotation being transferred using a belt (26).

[Claims]

[Claim 1]

Means for varying vibration strength in electrical vibrating devices comprising:
 a motor (1); and
 means for varying vibration strength on which is disposed a vibrator (2etc) to which rotation and eccentricity relative to a vibration axis (3) can be applied from the motor (1);
 wherein the means for varying vibration strength is operated by switching between rotation directions (4, 4a) of the motor (1).

[Claim 2]

Means for varying vibration strength in electrical vibrating devices as described in claim 1 wherein:
 either a vibrator (2) or a vibrator (2a) is spun freely on a rotation shaft (1a) at the rotation axis (3) while the remaining element is firmly secured; and
 a rotation stopper (2') is disposed.

[Claim 3]

Means for varying vibration strength in electrical vibrating devices as described in claim 1 comprising:
 a vibrator (2b) is rotatably supported at both ends by an axis (2bb) of a rotatable disk (2ba) at the rotation axis (3); and

engagement sections (2bd, 2bc) are disposed in a rotation direction.

[Claim 4]

Means for varying vibration strength in electrical vibrating devices as described in claim 1 wherein:

- an attachment section (1b) to which a coil spring (10) is attached is firmly secured to the rotation shaft (1a) of the rotation axis (3);
- a helical groove (2ca) formed in a spiral shape of the coil spring (10) is formed inside an opening of a vibrator (2c);
- the vibrator (2c) is rotatable on the coil spring (10) in a helical manner;
- and
- a stopper (11) is disposed at an end of the coil spring (10).

[Claim 5]

Means for varying vibration strength in electrical vibrating devices wherein:

- an attachment section (1b) to which a coil spring (10) is attached is firmly secured to the rotation shaft (1a) of the rotation axis (3);
- a projection (2db) slightly larger than the coil spring (10) is movably disposed inside an opening of the vibrator (2c);
- a stopper (11) is disposed at an end of the coil spring (10).

[Claim 6]

Means for varying vibration strength in electrical vibrating devices wherein:

- either a vibrator (2e) or a vibrator (2a) is spun freely on a rotation shaft (1a) at a rotation axis (3) while the remaining element is firmly secured;
- a staircase-shaped varying section (2ec) formed in a helical shape is disposed on the vibrator (2e);
- a varying section (2fe) formed on a claw (2fe') is disposed on the vibrator (2f); and
- a bearing (14a) allows the vibrator (2f) to operate in tandem along a rotation axis.

[Claim 7]

Means for varying vibration strength in electrical vibrating devices wherein:

- an attachment section (2Gg) is disposed on a rotation shaft (1a) of a rotation axis (3);
- a vibrator (2G) can be rotated around an axis (2Gf); and
- a ring (15) operating in tandem along a rotation axis allows the vibrator (2G) to provide varying eccentric vibrations.

[Claim 8]

Means for varying vibration strength in electrical vibrating devices wherein:

- attachment sections (2Hl, 2Hi) are disposed on a rotation shaft (1a) of a rotation axis (3);
- a vibrator (2H) is rotatable via an axis (2Hh) and an activating member (17); and
- the activating member (17) is rotatably connected to the attachment sections (2Hl, 2Hi) via shafts (2Hk, 2Hj), the activating member (17) being able to expand and contract via the attachment sections (2Hl, 2Hi).

[Claim 9]

A selector switch operated by twisting left and right on a battery case (6) wherein:

- pole plates (8a), positioned away from each other, are disposed from + and - poles of a motor (1) in a main unit (5);
- a pole plate (8) is disposed at a center position and abuts the pole plates (8a);
- a pole plate (8b) abuts either a + or - electrode of a battery in the battery case (6);
- an insulative section (9) is disposed on the pole plate (8b) on rear and side sections and comes into contact with the pole plate (8) and the pole plate (8a); and
- power is turned on when the pole plate (8b) is inserted between the pole plate (8) and the pole plate (8a).

[Claim 10]
A selector switch operated by twisting left and right on a battery case (6) wherein:
pole plates (8a), positioned away from each other, are disposed from + and - poles of a motor (1) in a main unit (5);
a pole plate (8) is disposed at a center position between the pole plates (8a);
a pole plate (8b) abuts either a + or - pole of a battery in the battery case (6), a pole plate (8c) being disposed opposite therefrom; and
the pole plate (8c) is inserted and placed in contact between the pole plate (8) and the pole plate (8a), contact between the opposite pole plate (8a) and the pole plate (8b) turning power on.

[Claim 11]
Means for varying vibration strength in electrical vibrating devices comprising:
a motor (1) providing motive power; and
a main unit (5) on which are disposed at least two means for varying vibration strength of electrical vibrating devices as described in any of claim 1 through claim 8 wherein rotation and eccentricity relative to a vibration axis (3) can be applied to a vibrator (2etc) from the motor (1).

[Claim 11]
Means for varying vibration strength in electrical vibrating devices as described in any one of claim 1 through claim 8 comprising:
a motor (1) providing motive power; and
a main unit (5) on which is disposed at least one strong vibrator (2a) and at least one weak vibrator (2b) rotated by the motor (1) around a rotation axis (3).

[Detailed description of the invention]

[0001]

[Fields of use in industry]

The present invention relates to means for varying vibrations in electrical vibration devices and a selector switch thereof that allows adjustment of the strength and amplitude of an electrical vibration device (e.g., an electrical massage device, electrical toothbrush, electrical hair brush, vibrating razor, vibrating alarm, electrical pen, vibrating pager, or an electrical toy).

[0002]

[Background technology]

Conventionally, the vibration of electrical vibrating devices has been selected through voltage.

[0003]

[Problems to be solved by the invention]

In this type of system, the rotation speed of the motor providing the motive power is adjusted using voltage. This method allows only rotational vibration strength to be changed but does not allow the vibration amplitude to be changed. The object of the present invention is to overcome this problem in the background technology.

[0004]

The present invention provides means for varying vibration strength in electrical vibrating devices including a motor (1), wherein one of the following means for varying vibration strength is operated by switching between rotation directions (4, 4a). Either a vibrator (2) or a vibrator (2a) is spun freely on a rotation shaft (1a) at the rotation axis (3) while the remaining element is firmly secured using a rotation stopper (2'). Alternatively, a vibrator (2b) is rotatably supported by the ends of an axis (2bb) of a rotatable disk (2ba). Engagement sections (2bd, 2bc) are disposed in a rotation direction. Alternatively, an attachment section (1b) to which a coil spring (10) is attached is firmly secured. A helical groove (2ca) formed in a spiral shape of the coil spring (10) is formed inside an opening of a vibrator (2c). The vibrator (2c) is rotatable on the coil spring (10) in a helical manner. According to another aspect the present invention provides means for varying vibration strength in electrical vibrating devices wherein eccentricity is varied through one of the following. An attachment section (1b) to which a coil spring (10) is attached is firmly secured to the rotation shaft

(1a) of a rotation axis (3). A projection (2db) slightly larger than the coil spring (10) is movably disposed inside an opening of the vibrator (2c). A stopper (11) is disposed at an end of the coil spring (10). Alternatively, either a vibrator (2e) or a vibrator (2a) is spun freely while the remaining element is firmly secured. A staircase-shaped varying section (2ec) formed in a helical shape is disposed on the vibrator (2e). A varying section (2fe) formed on a claw (2fe') is disposed on the vibrator (2f). A bearing (14a) allows the vibrator (2f) to operate in tandem along a rotation axis. Alternatively, an attachment section (2Gg) is disposed, a vibrator (2G) can be rotated around an axis (2Gf), and a ring (15) operating in tandem along a rotation axis allows the vibrator (2G) to provide varying eccentric vibrations. Alternatively, attachment sections (2Hl, 2Hi) are disposed, a vibrator (2H) is rotatable via an axis (2Hh) and an activating member (17), and the activating member (17) is rotatably connected to the attachment sections (2Hl, 2Hi) via shafts (2Hk, 2Hj). The

activating member (17) is able to expand and contract via the attachment sections (2Hl, 2Hi). According to another aspect the present invention provides a selector switch operated by twisting left and right on a battery case (6). Pole plates (8a), positioned away from each other, are disposed from + and - poles of a motor (1) in a main unit (5). A pole plate (8) is disposed at a center position and abuts the pole plates (8a). A pole plate (8b) abuts either a + or - electrode of a battery in the battery case (6). An insulative section (9) is disposed on the pole plate (8b) on rear and side sections and comes into contact with the pole plate (8) and the pole plate (8a). Power is turned on when the pole plate (8b) is inserted between the pole plate (8) and the pole plate (8a). Alternatively, pole plates (8a), positioned away from each other, are disposed from + and - poles of a motor (1) in a main unit (5). A pole plate (8) is disposed at a center position between the pole plates (8a). A pole plate (8b) abuts either a + or - pole of a battery in the battery case (6), a pole plate (8c) being disposed opposite therefrom. the pole plate (8c) is inserted and placed in contact between the pole plate (8) and the pole plate (8a), contact between the

opposite pole plate (8a) and the pole plate (8b), turning power on. According to another aspect, the present invention provides means for varying vibration strength in electrical vibrating devices. A motor (1) provides motive power. At least two means for varying vibration strength of electrical vibrating devices as described in any of claim 1 through claim 8 are disposed on the main unit (5). Rotation and eccentricity relative to a vibration axis (3) can be applied to a vibrator (2etc) from the motor (1). Alternatively, at least one strong vibrator (2a) and at least one weak vibrator (2b) are rotatably disposed on the main unit (5). The present invention allows strong and weak vibration amplitudes to be selected, and can also provide multiple combined vibrations.

[0005]

[Operation]

With means for varying vibrations as described above, an eccentric vibrator provides weak vibrations by moving two vibrators away from each other so that load balance is maintained. By overlapping the vibrators, the load becomes eccentric, providing strong vibrations. This selection can be made by operating a rotation selector switch to select the direction of the motor. Alternatively, manual stepped selections can be made for each vibration varying means. If one vibrator is used, a coil spring can be used as means for varying vibrations, with displacement of the vibrator and the elasticity of the coil spring allowing the vibrator to move away from the rotation axis to provide adjustable eccentricity. The closer the vibrator is to the rotation axis, the weaker the vibration and the further away, the stronger the vibration. If two or more vibration varying means or strong and weak vibrators are used, strong vibration waves and weak vibration waves can be generated to provide multiple mixed vibrations.

[0006]

[Embodiments]

The embodiments of the present invention will be described with references to the figures. Fig. 1 and Fig. 2 show a motor 1 and a rotation stopper 2'. A vibrator 2 and a vibrator 2a can be rotated by the motor 1 via a rotation axis 3 and the rotation stopper 2' allows one of these elements to be rotated freely while firmly fitting against and securing the other element.

[0007]

In Fig. 3 and Fig. 4, a vibrator (2b) is pivotably supported at the ends of bearings (2bb) on a rotating disk (2ba) that can rotate around the rotation axis (3). Engagement pieces (2bd, 2bc) are disposed in the rotation direction. [0008]

In Fig. 5 and Fig. 6, a coil spring (10) is attached to an attachment section (1b). The attachment section (1b) is fitted securely to a rotation shaft (1a) disposed on the rotation axis (3). A helical groove (2ca) formed in the helical shape of the coil spring (10) is disposed on the inside of an opening formed in a vibrator (2c). A stopper (11) is disposed at the end of the coil spring (10). These elements are provided so that the motor can be rotated in either direction through a rotation selection switch. [0009]

In Fig. 7, the attachment section (1b), to which the coil spring (10) is attached, is fitted securely to the rotation shaft (1a) on the rotation axis (1a). A projection (2db) slightly larger than the coil spring (10) is movably disposed in the inside of the opening of the vibrator (2c). The stopper (11) is disposed at the end of the coil spring (10). A movable switch (12) and a slot (12a) is disposed on a main unit (1c), and the movable vibrator (12) is disposed on the coil spring (10). The vibration level is low at the base, while at the end the vibration is high. Tilting the main unit (1c) and turning it upside-down serves as means for moving the vibrator. [0010]

In Fig. 8, either the vibrator (2e) or the vibrator (2f) is allowed to spin freely on the rotation axis (3) while the other element is firmly secured. A selector section (2ec) formed with a helical staircase shape is disposed on the vibrator (2e). A selector section (2fe) formed on a claw (2fe') is disposed on the vibrator (2f). A bearing (14a) allows the vibrator (2f) to move in tandem along the rotation axis. This embodiment illustrates an electric massage device. A head case (14) serves as a selector switch, with a switch projection (14c) being rotated helically into a switch groove (5a) in a stepped manner. In this embodiment, there are five steps. At step 5, the claw (2fe') of the selector section (2fe) engages with the top shelf of the selector section (2ec), resulting in overlapping between the vibrators (2e, 2f) and generating a high level of vibration due to the eccentric load. The vibrators (2e, 2f) separate at steps 4, 3, 2, 1, leading to a more balanced arrangement and less vibration. Going from steps 1, 2, and 3, the coil spring (10a) wrapped around the rotation shaft (1a) causes a washer (14b) and the bearing (14a) to rise up together and the vibration level is increased. Even without the coil spring (10a), the same effect can be obtained by having the selector section (2fe) pivotably supported by the bearing (14a). [0011]

In Fig. 9, an attachment section (2Gg) is disposed on the rotation axis (1a) on the rotation axis (3), and the vibrator (2G) is allowed to rotate by an axis (2Gf), and a ring (15) (bearing) operates in tandem with this along the rotation axis. As a result, the vibrator (2G) can be rotated eccentrically. The bearing operating in tandem along the operating line can be used to change the eccentricity by moving it away from the rotation axis. The closer it is to the rotation axis, the smaller the vibrations will be. The farther it is, the greater the vibrations will be. In this embodiment, a threaded section (16) is disposed on the main unit (5) to allow the bearing (15) to operate in tandem. [0012]

In Fig. 10, attachment sections (2Hl, 2Hi) are disposed on the rotation shaft (1a) of the rotation axis (3). A vibrator (2H) is rotatable through a shaft (2Hh) and an activating member (17). The activating member (17) is connected to the attachment sections (2Hl, 2Hi) and can be rotated via shafts (2Hk, 2Hj). Eccentricity can be changed by expanding or contracting the attachment sections (2Hl, 2Hi). This embodiment illustrates an electric massage device. A threaded section (16a) is formed on a head case (18) to serve as an expansion/contraction switch. [0013]

In Fig. 11, pole plates (8a), positioned away from each other, are disposed from the + and - poles of a motor (1) in a main unit (5). A pole plate (8) is disposed at the center and abuts the pole plates (8a). A pole plate (8b) abuts either the + or - electrode of the battery in a battery case (6). An insulative

section (9) is disposed on the pole plate (8b) on the rear and on the sides where it comes into contact with the pole plate (8) and the pole plate (8a). A selector switch can be twisted to the left and right on the battery case (6), and the power is turned on when the pole plate (8b) is inserted between the pole plate (8) and the pole plate (8a).

[0014]

Fig. 12 shows a circuit diagram for the structure shown in Fig. 11.

[0015]

In Fig. 13, pole plates (8a), positioned away from each other, are disposed from the + and - poles of a motor (1) in a main unit (5). A pole plate (8) is disposed away from the pole plates (8a). A pole plate (8b) abuts either the + or - electrode of the battery in a battery case (6). A pole plate (8c) is disposed opposite from the pole plate (8b). A selector switch can be twisted to the left and right on the battery case (6), and the power is turned on when the pole plate (8c) is inserted between the pole plate (8) and the pole plate (8a) and the opposing pole plate (8a) is placed in contact with the pole plate (8b).

[0016]

In Fig. 14, a main unit (5) is equipped with a motor (1) providing motive power and at least two electric vibrator vibration selecting means illustrated in Fig. 1 through Fig. 10 and including the vibrator (2etc), having an eccentricity relative to the rotation axis (3) of the motor (1) that can be freely adjusted. By using at least two vibration selecting means, large vibration waves (24) and small vibration waves (25) can be generated, providing multiple mixed vibrations. A switch (20) and a switch (21) can be slid up and down. The black up and down arrow heads marked ON and OFF correspond to the large vibration waves (22) and the circles with the horizontal lines marked ON and OFF correspond to the small vibration waves (23). The white up and down arrow heads of the slide switches (20, 21) are used to make selections.

[0017]

Fig. 15 shows the internal structure from Fig. 14 and is formed using the embodiment from Fig. 1 and Fig. 2. As the figures on the left shows, the same advantages can be provided when a strong vibrator (2a) and a weak vibrator (2b) are disposed on two motors (1). The bottom left drawing shows an embodiment where rotation from the motor (1) is transferred using a belt (26). Rotation transfer can, of course, be achieved using gears or the like as well. The drawing on the right shows a switch circuit. A system based on voltage and resistance can be used as well.

[0018]

[Advantages of the invention]

The present invention as described above can provide the following advantages. Vibration levels in an electrical vibrating device can be changed without raising or lowering voltages via resistors. Strong and weak vibration amplitudes can be varied freely. Also, multiple vibrations can be provided. By using at least two means for varying vibration levels or strong and weak vibrators, large vibration waves and small vibration waves can be generating, resulting in multiple mixed vibrations. Taking a massage device as an example, superior comfort can be provided compared to the use of conventional vibrations. Also, the switch structure is simpler, making operation easier.

特開平8-186951

(43) 公開日 平成8年(1996)7月16日

(51) Int.Cl. ⁴	識別記号	庁内整理番号	F I	技術表示箇所
H 0 2 K 7/075				
A 6 1 H 23/02	3 3 2			
B 0 6 B 1/02		Z		
H 0 2 K 7/10		D		

審査請求 未請求 請求項の数12 書面 (全 7 頁)

(21) 出願番号 特願平6-341118
 (22) 出願日 平成6年(1994)12月28日

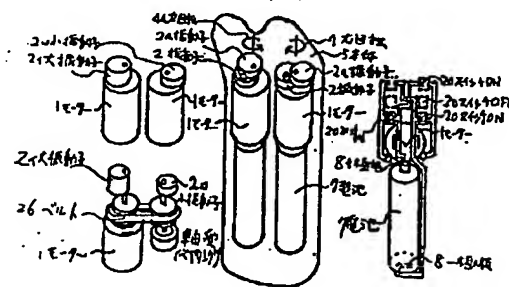
(71) 出願人 591235072
 照内 秀夫
 埼玉県幸手市大字千塚1860番地
 (72) 発明者 照内 秀夫
 埼玉県幸手市大字千塚1860番地

(54) 【発明の名称】 電動振動機器の振動量可変手段と切り換えスイッチ

(57) 【要約】

【目的】 従来、電動振動機器の振動量は抵抗による電圧で強弱を切り替えていた。抵抗を使わず振動量、振動巾を大少可変自在とした電動振動機器の振動量可変手段とその切り換えスイッチを提供する。

【構成】 回転心(3)の回転軸(1a)に可変振動子(2 etc)を設け、モーターの逆転切り換えスイッチで操作するか、可変部(2 etc)を設けて手動で切り替える。2つ以上の振動量可変手段を使用するか大振動子(2イ)と少振動子(2ロ)を設ける。1つのモーター(1)でベルト(26)方式で回転伝達する。



【特許請求の範囲】

【請求項1】 モーター(1)と、前記モーター(1)により回転心(3)から回転自在に振動子(2 e t c)を自在に偏する前記振動子(2 e t c)を設けた振動量可変手段とを備え、前記、振動量可変手段をモーター(1)の回転方向(4、4 a)の切り換えによって操作することを特徴とした電動振動機器の振動量可変手段。

【請求項2】 回転心(3)の回転軸(1 a)に振動子(2)か振動子(2 a)のどちらかを空転して、片方を固く嵌着し回転止め部(2')を設けた特許請求の範囲請求項1記載の電動振動機器の振動量可変手段。

【請求項3】 回転心(3)に回転自在な回転盤(2 b i)の枢支部(2 bロ)両端に振動子(2 b)を回動自在に枢着し、回動方向に係止部(2 bニ、2 bハ)を設けた特許請求の範囲請求項1記載の電動振動機器の振動量可変手段。

【請求項4】 回転心(3)の回転軸(1 a)にコイルバネ(10)を取り付けた取付部(1 b)を固く嵌着し、コイルバネ(10)の螺旋形状にした螺旋溝(2 c i)を振動子(2 c)の開口部内側に設け、コイルバネ(10)に螺旋回転自在に振動子(2 c)を設け、コイルバネ(10)の端に止め部(11)を設けた特許請求の範囲請求項1記載の電動振動機器の振動量可変手段。

【請求項5】 回転心(3)の回転軸(1 a)にコイルバネ(10)を取り付けた取付部(1 b)を固く嵌着し、振動子(2 c)の開口部内側をコイルバネ(10)より少し大きめにし突起(2 dロ)を設け遊動可能にし、コイルバネ(10)の端に止め部(11)を設けた電動振動機器の振動量可変手段。

【請求項6】 回転心(3)の回転軸(1 a)に振動子(2 e)か振動子(2 f)のどちらかを空転して、片方を固く嵌着し、振動子(2 e)に螺旋形状にした階段形状の可変部(2 eハ)を設け、振動子(2 f)に爪部(2 fホ')に形成した可変部(2 fホ)を設け、軸受け(14 a)により振動子(2 f)を回転心線上に連動することを特徴とした電動振動機器の振動量可変手段。

【請求項7】 回転心(3)の回転軸(1 a)に取付部(2 Gト)を設け、振動子(2 G)を枢軸(2 Gヘ)により回動自在にし、回転心線上に連動するリング(15)より振動子(2 G)を偏心回転変動することで操作したことを特徴とした電動振動機器の振動量可変手段。

【請求項8】 回転心(3)の回転軸(1 a)に取付部(2 Hオ、2 Hリ)を設け、振動子(2 H)を枢軸(2 Hチ)と作動部材(17)により回動自在にし、作動部材(17)を軸(2 Hル、2 Hヌ)で回動自在に取付部(2 Hオ、2 Hリ)に連結し、前記、取付部(2 Hオ、2 Hリ)を伸縮自在にすることにより操作し偏心量を変えることを特徴とした電動振動機器の振動量可変手段。

【請求項9】 本体(5)に内蔵したモーター(1)の+極から極板(8 a)を間をおいて設け、中央に極板

(8)を設け、前記、極板(8 a)に互いに当接し、電池ケース(6)に電池+-いずれかの極に当接した極板(8 b)を設け、極板(8ト)と極板(8 a)に接触する両側と後ろに絶縁部(9)を設けて前記、極板(8ト)と極板(8 a)の間に差し込みすることで電源をONとし、電池ケース(6)の左右の回しにより逆転操作する切り換えスイッチ。

【請求項10】 本体(5)に内蔵したモーター(1)の+極から極板(8 a)を間をおいて設け、中央に極板(8)を前記、極板(8 a)に間をおいて設け、電池ケース(6)に電池+-いずれかの極に当接した極板(8 b)を設けて反対側に極板(8 c)を設け、極板(8 c)を極板(8)と極板(8 a)の間に差し込み接触させ反対側の極板(8 a)に極板(8 b)を接触させることで電源をONとし、電池ケース(6)の左右の回しにより逆転操作する切り換えスイッチ。

【請求項11】 原動力にモーター(1)と、前記モーター(1)により回転心(3)から回転自在に振動子(2 e t c)を自在に偏する前記振動子(2 e t c)を設けた特許請求の範囲請求項1～8記載の電動振動機器の振動量可変手段のいずれか2つ以上を本体(5)に設けた電動振動機器の振動量可変手段。

【請求項12】 原動力にモーター(1)と、前記モーター(1)により回転心(3)から回転自在に1つ以上の大振動子(2 i)と1つ以上の少振動子(2ロ)を本体(5)に設けた電動振動機器の振動量可変手段。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、電動振動機器(電動マッサー、電動ハブラシ、電動ヘアブラシ、震動カミソリ、震動アラーム、電動ペン、震動ポケットベル、電動玩具など)の振動量、振動巾を多少可変自在とした電動振動機器の振動量可変手段とその切り換えスイッチに関するものである。

【0002】

【従来の技術】従来、電動振動機器の振動量は電圧により強弱を切り替えていた。

【0003】

【発明が解決しようとする課題】上記この方式は、原動力のモーターの回転の速度を電圧の調節で行うものであり、この方法では回転振動の強弱だけで振動巾までは変えることはできなかった。本発明は、従来の技術の有るこのような問題点に鑑みてなされたものである。

【0004】

【課題を解決するための手段】モーター(1)と、前記モーター(1)により回転心(3)から回転自在に振動子(2)か振動子(2 a)のどちらかを空転して、片方を固く嵌着し回転止め部(2')を設けるか、回転盤(2 b i)の枢支部(2 bロ)両端に振動子(2 b)を回動自在に枢着し、回動方向に係止部(2 bニ、2 b

ハ)を設けるか、コイルバネ(10)を取り付けた取付部(1b)を固く嵌着し、コイルバネ(10)の螺旋形状にした螺旋溝(2cイ)を振動子(2c)の開口部内側に設け、コイルバネ(10)に螺旋回転自在に振動子(2c)を設け、コイルバネ(10)の端に止め部(11)を設け、以上の振動量可変手段をモーター(1)の回転方向(4、4a)の切り換えによって操作する電動振動機器の振動量可変手段。回転心(3)の回転軸(1a)にコイルバネ(10)を取り付けた取付部(1b)を固く嵌着し、振動子(2c)の開口部内側をコイルバネ(10)より少し大きめにし突起(2dロ)を設け遊動可能にし、コイルバネ(10)の端に止め部(11)を設けるか、振動子(2e)か振動子(2f)のどちらかを空転して片方を固く嵌着し、振動子(2e)に螺旋形状にした階段形状の可変部(2eハ)を設け、振動子(2f)に爪部(2fホ')に形成した可変部(2fホ)を設け、軸受け(14a)により振動子(2f)を回転心線上に連動するか、取付部(2Gト)を設け、振動子(2G)を枢軸(2Gヘ)により回動自在にし、回転心線上に連動するリング(15)より振動子(2G)を偏心回転変動するか、取付部(2Hオ、2Hリ)を設け、振動子(2H)を枢軸(2Hチ)と作動部材(17)により回動自在にし、作動部材(17)を軸(2Hル、2Hヌ)で回動自在に取付部(2Hオ、2Hリ)に連結し、前記、取付部(2Hオ、2Hリ)を伸縮自在にする。以上のことにより操作し偏心量を変える電動振動機器の振動量可変手段。本体(5)に内蔵したモーター(1)の+極から極板(8a)を間をおいて設け、中央に極板(8)を設け、前記、極板(8a)に互いに当接し、電池ケース(6)に電池+いずれかの極に当接した極板(8b)を設け、極板(8ト)極板(8a)に接触する両側と後ろに絶縁部(9)を設けて前記、極板(8ト)極板(8a)の間に差し込みすることで電源をONとし、電池ケース(6)の左右の回しにより逆転操作するか、本体(5)に内蔵したモーター(1)の+極から極板(8a)を間をおいて設け、中央に極板(8)を前記、極板(8a)に間をおいて設け、電池ケース(6)に電池+いずれかの極に当接した極板(8b)を設けて反対側に極板(8c)を設け、極板(8c)を極板(8)と極板(8a)の間に差し込み接触させ反対側の極板(8a)に極板(8b)を接触させることで電源をONとし、電池ケース(6)の左右の回しにより逆転操作する切り換えスイッチ。原動力にモーター(1)と、前記モーター(1)により回転心(3)から回転自在に振動子(2eトc)を自在に偏する前記振動子(2eトc)を設けた特許請求の範囲請求項1~8記載の電動振動機器の振動量可変手段のいずれか2つ以上を本体(5)に設けるか、回転自在に1つ以上大振動子(2イ)と1つ以上少振動子(2ロ)を本体(5)に設けた以上の電動振動機器の振動量可変手段。本発明

は、大少振動巾を自在に変えることができ、又、多重振動が可能であり、以上のような構成よりなる電動振動機器の振動量可変手段。

【0005】

【作用】上記のように構成された振動量可変手段により偏心振動子は、2つの振動子の場合には互いに離れることにより荷重のバランスが保たれ小振動となり、互いに重なり合うことで荷重が片寄り大振動となる。その操作をモーターの回転切り換えスイッチにて正逆回転により行うか、それぞれの振動量可変手段を段階的に手動で行う。1つの振動子の場合には、コイルバネ使用の振動量可変手段は振動子の移動によりコイルバネの弾力を利用して回転心から離れさせることで偏心量を変えるものである。その他も連動させたリングや作動部材により回転心から離れさせることで偏心量を変える。回転心に近ければ少振動、遠ければ大振動となる。又、2つ以上の振動量可変手段か大少振動子を使用することにより、大振動波動、少振動波動が生まれ、多重ミックス振動となる。

【0006】

【実施例】以下、本発明の実施例について図面を参照して説明すると、図1、図2において、モーター(1)と、前記モーター(1)により回転心(3)から回転自在に振動子(2)か振動子(2a)のどちらかを空転して、片方を固く嵌着し回転止め部(2')を設ける。【0007】図3、図4に示される図では、回転心(3)に回転自在な回転盤(2bイ)の枢支部(2bロ)両端に振動子(2b)を回動自在に枢着し、回動方向に係止部(2bニ、2bハ)を設ける。

【0008】図5、図6に示される図では、回転心(3)の回転軸(1a)にコイルバネ(10)を取り付けた取付部(1b)を固く嵌着し、コイルバネ(10)の螺旋形状にした螺旋溝(2cイ)を振動子(2c)の開口部内側に設け、コイルバネ(10)に螺旋回転自在に振動子(2c)を設け、コイルバネ(10)の端に止め部(11)を設ける。以上はその操作をモーターの回転切り換えスイッチにて正逆回転により行うものである。

【0009】図7に示される図では、回転心(3)の回転軸(1a)にコイルバネ(10)を取り付けた取付部(1b)を固く嵌着し、振動子(2c)の開口部内側をコイルバネ(10)より少し大きめにし突起(2dロ)を設け遊動可能にし、コイルバネ(10)の端に止め部(11)を設ける。本体(1c)に移動スイッチ(12)と長孔(12a)を設け、コイルバネ(10)に遊動自在な振動子(12)を移動する。もとの方では少振動になり、先の方では大きく揺れるため大振動になる。その他、振動子を移動する手段として本体(1c)を傾けることや逆さにすることにより移動できる。

【0010】図8に示される図では、回転心(3)の回転軸(1a)に振動子(2e)か振動子(2f)のどち

らかを空転して、片方を固く嵌着し、振動子(2e)に螺旋形状にした階段形状の変部(2eハ)を設け、振動子(2f)に爪部(2fホ')に形成した変部(2fホ)を設け、軸受け(14a)により振動子(2f)を回転心線上に連動する。この実施例は電動マッサージ器の図であり、ヘッドケース(14)が切り替えスイッチになっており、スイッチ突起(14c)がスイッチ溝(5a)に段階的に螺旋状に回し入れようになっている。この実施例では5段階になっており、5では変部(2eハ)の上段に変部(2fホ)の爪部(2fホ')が掛り振動子(2e、2f)が重なり荷重が片寄り大振動をおこす。4、3、2、1と段階的に振動子(2e、2f)が開きバランスが保たれるようになり少振動となってゆく。又、1、2、3、と回すと、回転軸(1a)に巻着したコイルバネ(10a)により、ワッシャ(14b)と軸受け(14a)と連動して浮上して大振動となってゆく。コイルバネ(10a)を使用しなくても変部(2fホ)を軸受け(14a)に回転自在に軸着すれば同じ作用をする。

【0011】図9に示される図では、回転心回転心(3)の回転軸(1a)に取付部(2Gト)を設け、振動子(2G)を枢軸(2Gヘ)により回転自在にし、回転心線上に連動するリング(15)(ベアリング)を設ける。それにより振動子(2G)を偏心回転変動することで操作線上に連動させたベアリングにより回転心から離れさせることで偏心量を変える。回転心に近ければ少振動、遠ければ大振動となる。この実施例では、本体(5)にネジ部(16)を設けベアリング(15)を連動させるようになっている。

【0012】図10に示される図では、回転心(3)の回転軸(1a)に取付部(2Hオ、2Hリ)を設け、振動子(2H)を枢軸(2Hチ)と作動部材(17)により回転自在にし、作動部材(17)を軸(2Hル、2Hヌ)で回転自在に取付部(2Hオ、2Hリ)に連結し、前記、取付部(2Hオ、2Hリ)を伸縮自在にすることにより操作し偏心量を変える。この実施例は電動マッサージ器の図であり、ヘッドケース(18)にネジ部(16a)を設け伸縮スイッチになっている。

【0013】図11に示される図では、本体(5)に内蔵したモーター(1)の+極から極板(8a)を間をおいて設け、中央に極板(8)を設け、前記、極板(8a)に互いに当接し、電池ケース(6)に電池+-いずれかの極に当接した極板(8b)を設け、極板(8と)極板(8a)に接触する両側と後ろに絶縁部(9)を設けて前記、極板(8と)極板(8a)の間に差し込みすることで電源をONとし、電池ケース(6)の左右の回しにより逆転操作する切り換えスイッチ。

【0014】図12に示される図では、図11における回路図である。

【0015】図13に示される図では、本体(5)に内

蔵したモーター(1)の+極から極板(8a)の間をおいて設け、中央に極板(8)を前記、極板(8a)の間をおいて設け、電池ケース(6)に電池+-いずれかの極に当接した極板(8b)を設けて反対側に極板(8c)を設け、極板(8C)を極板(8)と極板(8a)の間に差し込み接触させ反対側の極板(8a)に極板(8b)を接触させることで電源をONとし、電池ケース(6)の左右の回しにより逆転操作する切り換えスイッチ。

10 【0016】図14に示される図では、原動力にモーター(1)と、前記モーター(1)により回転心(3)から回転自在に振動子(2etc)を自在に偏する前記振動子(2etc)を設けた図1~10記載の電動振動機器の振動量可変手段のいずれか2つ以上を本体(5)に設ける。2つ以上の振動量可変手段を使用することにより、大振動波動(24)、少振動波動(25)が生まれ、多重ミックス振動となる。スイッチ(20)とスイッチ(21)が互いに上下スライド可能にしてあり、マーク▲-▼ON、OFFが大振動(22)、マーク◎ON、OFFが少振動(23)、スライドスイッチ(20、21)のマーク△▽を合わせる。

【0017】図15に示される図では、図14の内部構造であり図1、2の実施例を使用しており、左図のように2つのモーター(1)に大振動子(2イ)と少振動子(2ロ)を設けても同じ効果が得られる。左下図は1つのモーター(1)でベルト(28)方式で回転伝達してある実施例である。その他歯車により回転伝達ももちろんのことである。右図はスイッチ回路図である。抵抗による電圧式でもよい。

30 【0018】
【発明の効果】本発明は、以上説明したように構成されているので、以下に記載されるような効果を奏する。電動振動機器の振動量を抵抗による電圧の上げ下げを使わず振動量を変えることができ、大少振動巾を自在に変えることができ、又、多重振動が可能であり、2つ以上の振動量可変手段か大少振動子を使用することにより、大振動波動、少振動波動が生まれ、多重ミックス振動となる。マッサージ器を例にすれば従来の振動よりこりをほごすることができる。又、スイッチの構成を簡単にして操作をやりやすくしてある。

【図面の簡単な説明】

【図1】電動振動機器の振動量可変手段の実施例と1部分解図

【図2】電動振動機器の振動量可変手段の実施例

【図3】電動振動機器の振動量可変手段の実施例と1部分解図

【図4】電動振動機器の振動量可変手段の実施例

【図5】電動振動機器の振動量可変手段の実施例と1部分解図と断面図

【図6】電動振動機器の振動量可変手段の実施例

【図7】電動振動機器の振動量可変手段の実施例と1部分解図と断面図

【図8】電動振動機器の振動量可変手段の実施例と1部分解図

【図9】電動振動機器の振動量可変手段の実施例と1部分解図

【図10】電動振動機器の振動量可変手段の実施例と1部分解図

【図11】モーターの逆転切り換えスイッチの実施例

【図12】モーターの逆転切り換えスイッチの実施例の回路図

【図13】モーターの逆転切り換えスイッチの実施例

【図14】電動振動機器の振動量可変手段の実施例とスイッチ部使用図

【図15】図14の実施例の内部構造部分とスイッチ回路図

【符号の説明】

1 モーター

1a 回転軸

1b 取付部

2、2a、2b、2c、2d、2e、2f、2G、2H 振動子

2' 回転止め

2i 大振動子

2ロ 少振動子

2bハ、2bニ 係止

2cイ 螺旋溝

2dロ 突起

2eハ、2fホ 可変部

2fホ' 爪部

* 2Gト、2Hリ、2Hオ 取付部

2Gヘ、2Hチ 枢軸

2Hヌ、2Hル 軸

3 回転心

4 右回転

4a 左回転

5 本体

5a スイッチ溝

6 電池ケース

7 電池

8、8a、8b、8c 極板

9 絶縁部

10、10a コイルバネ

11 止め部

12 移動スイッチ

12a 長孔

14 ヘッドケース

14a 軸受け

14b ワッシャ

20 14c スイッチ突起

15 リング（ベアリング）

16、16a、ネジ部

17 作動部材

18、19 ヘッドケース

20、21 スイッチ

22 大振動ON、OFF

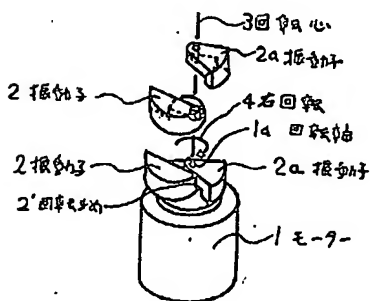
23 少振動ON、OFF

24 大振動波動

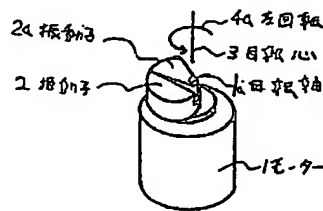
25 小振動波動

* 30 26 ベルト

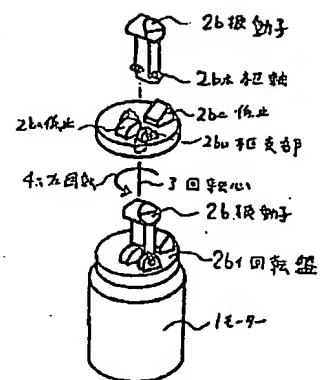
【図1】



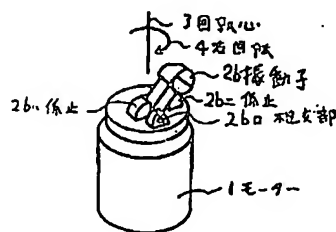
【図2】



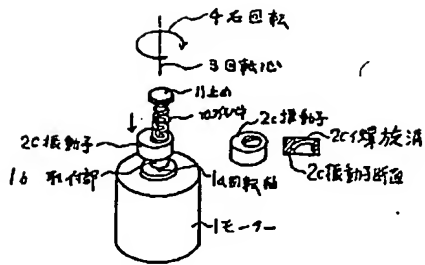
【図3】



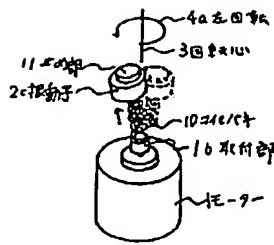
【図4】



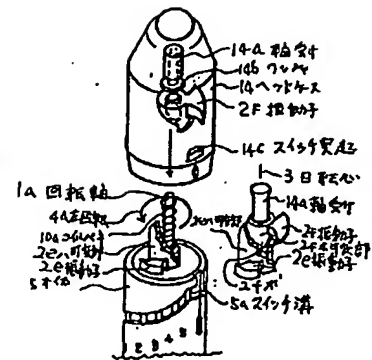
【図5】



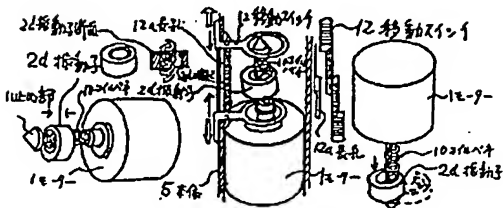
【図6】



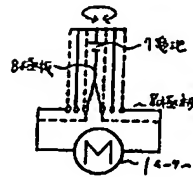
【図8】



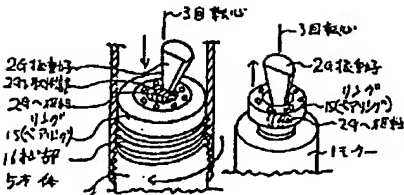
【図7】



【図12】



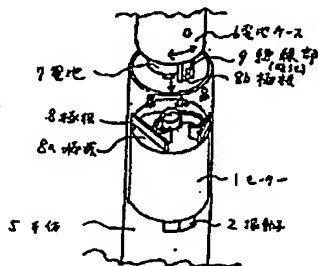
【図9】



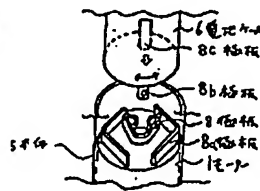
【図10】



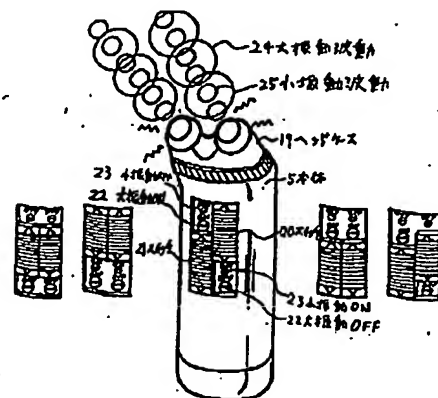
【図11】



【図13】



【図14】



【圖15】

